



OLPC Fundamental Ideas on Learning

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I. The Power is in the Children

Technology is present in many aspects of our lives, from simple applications such as automatic doors of a supermarket, to more complex in the medical field; technologies have changed the ways we live. However, technology has not achieved the expected and announced changes in the field of education. Impact assessments indicate many reasons for these changes not to be achieved. Some say the culture of the school does not contribute to the adoption of technology, or that policies are not compatible with the vision of using technology (Blumenfeld et. Al, 2000); and others report that the limited access teachers have to technology, and the lack of knowledge thereof, result in minimal changes in learning environments (Cuban 1986, Sheingold, & Hadley, 1990; Cuban, 2001). What these studies did not predict is that the key to true power and to a profound change in learning is within the children, and not just teachers.

In 1980, Seymour Papert described "how children had learned to program a computer could use very specific computational models for thinking about thinking and learning about learning and in so doing, improve their skills as psychologists and epistemologists." However, an important element that was not really present at the time, but available in a controlled way, was the personal computer. Children only had access to computer terminals or computers in computer lab environments. The one to one learning model forces us to rethink education, not only because children use technology in a powerful way, but also



because it alleviates the lack of teacher experience and preparation, a bottleneck that limits impact of technology in education.

II. Why is the Laptop a Good Tool for Learning?

Learning is individual, therefore 1:1 access to connected laptop, engage children into their own knowledge acquisition based on personal interests and experience through the possibility of creation so they become no longer passive recipients of information. The classroom is no longer limited to a pre-determined, one-size-fits-all approach. this way, children learn by teaching and by actively assisting other learners and thereby liberating the teacher to be able to focus their experience and expertise where it is most needed.

This is based on the theory pioneered by Papert called *constructionism*. In the book, *The Children's Machine*, Papert compares constructionism to the African proverb: If a man is hungry, give him a fish, but it is better to give him a line and teach him to catch fish himself. "Constructionism is built on the assumption that children will do best by finding ("fishing") themselves the specific knowledge they need; organized or informal education can help most by making sure they are supported morally, psychologically, materially and intellectually in their efforts." (139)

A laptop is the most flexible learning tool. It allows children to be creative and productive and fit into today's digital world. If children really want to learn something, and have the opportunity to learn it in use, they will do so even if the teaching is poor. Children can take ownership and express themselves by writing stories, taking pictures, making movies, exploring scientific phenomena, inventing learning games, or solving mathematical problems. They can access endless amounts of information, expertise and global collaboration to pursue learning in areas of personal interest.

III. What Makes the XO Laptop Different?

At first glance, it is easy to see that the XO laptop is different from other laptops. Its appearance may seem "toy-like". Despite its look, the extreme durability of the XO laptop allows learning to take place beyond the classroom, but also at home, with family members, and in communal areas where meaningful learning experiences also take place. Its look was purposely designed but it has more to offer than a toy. The "children's machine" was created having three ideals in mind:

- A low floor: so children of any age can use it regardless of their level
- Thick walls: so any number of projects and activities can be developed
- A high ceiling: so that the sky be the limit on its use and the imagination can be created.

The XO is not a tool to achieve knowledge just by "consuming information" but by making learning visible, constructing, and applying learning through critical thinking. It does not contain rote software that you and I might use for school and work, but rather an educational, intuitive, expressive platform designed specifically for children.

Collaboration: The XO creates its own mesh network out of the box. Each laptop is a full-time wireless router. Children as well as their teachers and families in the most remote regions of the globe will be connected to one another even without Internet.



Science: Through the MIC_IN port, a large variety of low cost & DIY sensors can be used with the XO so that each child owns their own personal mobile physics lab.

The laptop is an open-source machine: free software gives children the opportunity to fully own the laptop in every sense. While we don't expect every child to become a programmer, we don't want any ceiling imposed on those children who choose to modify their laptops. We are using open document formats for much the same reason: transparency is empowering. The children, and their teachers, will have the freedom to reshape, reinvent, and reapply their software, hardware, and content.

IV. OLPC's Core Principles: Implications for Learning

“When we talk about computers in education, we should not think about a machine having an effect. We should be talking about the opportunity offered us by this computer presence, to rethink what learning is all about, to rethink education.” (Papert y E. & L. Group. 1990)

OLPC hopes that each government, non-profit organization and local partner not only implements technology into schools and homes, but actively engages in a process of redefining their respective country's learning and education—having in mind local needs and local strengths (without this, the true potential of laptops will not be recognized). This includes the following aspects:

Curriculum Integration

Integration of the laptop and its associated learning paradigm into the curriculum, and, by effect, allow the curriculum to become more flexible so that students can develop critical 21st century skills. This should also expand to rethinking the former limitation and walls of School to allow alternate dynamics and informal environments to take root. Such environments, like after schools, community centers or clubs are key for the project because they allow children the opportunity to learn/teach in any time/space by driving their own learning process uninhibited by the rigors of time and structures of the classroom. It also allows them a chance to explore topics that are not covered in the curriculum and engage with those outside of their classrooms.

Teacher Support

During this needed change that comes with introduction of laptops into education, teachers will need to be fully supported. They will need assistance to not only understand how to use the laptop, but how to integrate the laptops into lessons in meaningful ways that exemplify the constructionist paradigm advocated by OLPC as well as the country's core educational structure. In order to achieve this, teachers will need workshops and trainings (led much in the same way that we hope they will recreate with their students), documentation, spaces for discussion, feedback, sharing ideas, etc. This is an on-going effort that will need to be closely tracked because teachers, after all, are the ones on the front lines, truly implementing the project and, therefore, a main proponent or limitation to its success.

Community Outreach and Advocacy

Teachers, headmasters, parents, community members and children will also need to fully understand their respective country's goals for the laptops and put personal significance to them, so that it becomes a national effort allowing each citizen and community ways to understand; insert themselves and benefit



from the project. Every member of a country needs to be actively involved in education for a true impact to be felt.

Skilled, passionate core team

In order to achieve this implementation and redefinition, a knowledgeable team is needed, which OLPC refers to as the “Core Team,” who will need to be formed in order to create, plan and coordinate these efforts with dedication, passion and creativity while directly interfacing with government officials, the country’s educational stakeholders, teachers, students, parents, and communities.

In addition to these overarching, ongoing, long-term needs in order for the program to be successful, OLPC has five main principles that should be taken into consideration during the initial stage of the project. These include:

Child Ownership

When a child owns their own laptop, they are no longer determined to a one-size fits all approach in the classroom, they can cater their learning to their own life experiences, thus enhancing their understanding of the subject or lesson. The learning experience becomes unique for each child since it allows children to learn at their own rhythm and according to their interests. Full access to a computer uniquely fosters learning by doing and allowing children to “think about thinking,” in ways that are otherwise impossible, children are able to explore, create, express themselves and fully engage with the technology in meaningful ways, which is key to develop active and capable citizens of the 21st century.

Additionally, when a child owns their laptop, the classroom expands with each child being able to take their laptops home as they can learn anytime, anywhere and the way they want; they dedicate more time to their school-work; they read and write more, but, mainly, concentrate and research on topics of their own interest--informal education becomes part of learning process.

When a child is given their own laptop, they are reinforced with a sense of belonging—important for the development of their self-esteem. This is coupled with new duties and responsibilities, such as protecting, caring for, and sharing this valuable equipment. The child’s family and community become involved in the project as well. Children teach their parents how to read, siblings are introduced to educational games, community members use the laptop to solve local problems and build initiatives. As parents become more involved with the learning process of children, the process of education becomes a process of co-responsibility between parents, teachers, community and the student.

In classrooms with laptop ownership, the teacher is no longer pressured by being the sole-keeper of information--a stressful situation for a teacher who might have completed only a few more grades levels than their students--those former limits are no longer and the teacher is free to use their skills to help guide their students to access massive amounts of information far beyond the schoolyard, district and, even, country.

Low Ages

Introduction, at a young age, of powerful educational experiences that develop a child’s critical thinking, problem-solving, self-expression, entrepreneurial and creativity skills is crucial, making it best to focus



this project in primary grades so that younger students can develop a fluency with technology to develop powerful uses of technology in a child's educational experience is key to the development of a child's critical thinking, problem-solving, self-expression, entrepreneurial and creativity skills. By working in primary grades, students will develop a fluency that will follow them through their educational experience. It is also well known that because of brain plasticity, experiences learned during early childhood years are kept in the brain as synopsis.

Saturation

It is understandable for one to deduce that spreading laptops over the largest population and location would create the largest outcomes, that is why the computer lab model has been used in different countries to varying degrees of success, but, when the mission of the project is to change educational systems, like the idea of one laptop per child, this model falls far short to deliver this substantial change as children's time with and access to technology is greatly reduced.

Saturation can happen at different levels: community (an entire community receives laptops), school (an entire school), grade (in one or more grades within a school), country or region wide (an entire country or region receives laptops). When saturation is achieved, possibility of theft is greatly reduced since each child already have their own and the community is aware and integrated into the project; there is no tension within schools and communities; some projects have witnessed saturation to act as an equalizer among children from different social classes on different sides of the country, and like any new introduction of ideas into communities, a new culture needs to be created and supported in order for it to succeed, when an entire community, region or country is included this process is much easier and a collective unified effort.

On a more simplistic level, when a community or country is facing an illness, the solution is not to vaccinate some, but all. In this project, lack of access to quality education is the illness and using a laptop as a means to quality education for each and every primary-aged student is the vaccine we advocate.

Connection

The wireless connection provides each child with access to a global community of information, research, culture and communication. The child's resources are no longer restricted to those of the classroom. When each child owns a connected laptop, they are able to share their work, collaborate, peer-edit and reflect. Children permanently connected to chat, share information on the web, gather by videoconference, make music together, edit texts, read e-books and enjoy the use of collaborative games on line.

Free and Open Source

The child with an XO is not just a passive consumer of knowledge, but an active participant in a learning community. Rather than using software that was created for adult office workers, the XO laptop has an educational platform called Sugar, made especially for and to facilitate 1:1 laptop use. As the children grow and pursue new ideas, the software, content, resources, and tools should be able to grow with them. The very global nature of OLPC demands that growth be driven locally, in large part by the children

Figure 1: Sugar Activities

In the upper right quadrant, there are “game” type of Activities that allow the user to play and interact with concepts that are established by the person who developed the Activity (Moon, Maze, Implode, etc.). In the upper left quadrant, there are “utility” type of Activities that, while allowing connection to multiple items of various disciplines, are limited in use or experience. These are much more focused on access to information (Browse, Calculate, Wikipedia, Measure, Reading, among others). In the lower right quadrant, there are “construction” type of Activities that allow connections to multiple concepts, but that are still limited in the user experience. Among these Activities is Write, as its name implies, Write allows the user to compose documents, and Paint, that allows the user to draw a picture (Write, Paint, Sailing, Record, Calculate, Memorize, Portfolio, etc.). Moving towards the lower left quadrant, there are open-end programming Activities such as Turtle Art, Etoys, Scratch, and Pippy that allow users to design and create different kinds of projects on a variety of topics. Finally, in the center, there are all system Activities (Log, Terminal, Restore, Backup, etc.).

VI. Does the XO Laptop come with a Curriculum?

The XO laptop does not come with a ready-made curriculum. At OLPC, we are not defining what children should learn because we believe that those decisions need to be made by the respective country. We offer support by providing tools (in the form of activities) as well as concrete ideas of how to become familiar with those tools and how to use them to facilitate a meaningful learning experience. The tools can be single purpose activities such as Record, Write, Chat, Calculate, Paint, etc.; games such as Maze, Memorize and Implode; content specific activities such as Moon and TamTam; or more sophisticated and open ended activities such as TurtleArt, Etoys, Scratch, and Pippy (find a full activity resource list in section VIII) that allows users to design and create projects about a variety of topics. We also make it easy to package digital libraries of reading materials or books in the form of “content collections.” The best way to engage in these activities and content is through project-based learning.

In order for a project, such as one laptop per child to be successful, the project’s ideas and goals need to be closely aligned with those of the country in which it is being deployed. This requires direct interaction between the project, educational stakeholders and the educational framework. If this interaction is achieved, then OLPC can be a powerful tool for countries to attain their larger development goals, education sector strategic plans, education policies and curriculum¹ among others, and provide support and efficient ways of improvement. Starting from the higher level (framework structure), the integration should create a chain reaction that reaches the lower levels (multiple learning environments).

In the field, teachers and learners should be able to deploy the final product of such integration transformed with educational projects. It’s in this scenario where the connection between the constructionist paradigm advocated by OLPC and the country’s core educational structure interact to give students and teachers new and encouraging ways to learn. The final purpose of an integration within all levels is, in the basic level, the validation of technology as a valuable mean (tool) for educational purposes.

¹ For some contexts, the framework of work is also determined by a broader vision for regions like the case of the commitment for the Millennium Development Goals (MDGs)

OLPC advocates the use of educational projects as a bridge among the framework and the learning process. The reason for this relies in the possibilities that a Project-Based Learning (PBL) vision brings to a learning environment. Design, problem solving, collaborative work, technology integration and fluency, creativity, interdisciplinary work, decision making, and learning outside the classroom among other skills, are the focus of a PBL strategy, ideal for a technology education compliancy. Projects allow the construction of tangible outcomes from students following the constructionist approach, key for the accomplishment of OLPC learning vision. With projects students can follow their own interests and empower their own learning process making it more significant.

The “project” is the pillar of constructionism. Through project-based learning, the student becomes more than just the student learning math or science, but the mathematician or scientist conducting research. It is difficult for most to imagine computers offering little more than browsing capacity, but the XO’s activities were developed to lend themselves to project-based work. A compilation of exercises connected to the fourth grade curriculum can be found here <http://wiki.sugarlabs.org/go/Math4Team/Florida>. Below an example of projects connected to the standard of measurement concepts:

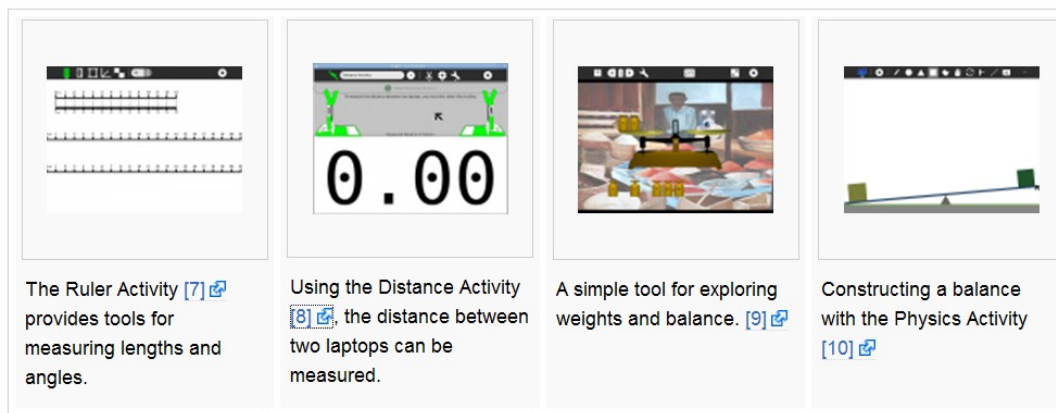


Figure 2: Project ideas, forth grade math

These projects can be duplicated, but instead, challenge yourself to use them as a jumping board to create your own projects based on the specifics of your deployment’s community and the tips above. Projects are educational pieces of a puzzle that should provide the learning community surrounding the project with concrete examples to follow and as any puzzle piece it should be kept as a long-lasting guide. The compilation of these designed projects is key for the upcoming generations of teachers and students. A comprehensive database of projects that can bring ideas and guidance for the creation of new ones is an important endeavor that OLPC is planning to develop in the future.

VII. Assessment

For anyone who has worked in education, the positive shifts in children that would never be fully measured by a test or numerical data are significant and clear. Fortunately, educational communities have come to understand that standardized testing is not the only dimension to measure the impact that 1 to 1 computing has on children and the communities where they live. Other factors such as the ability to problem solving, critical thinking, use of multiple information sources, reflectiveness and communication skills using multiple media, team and individual working, self learning, and bringing significant changes

to their communities are new dimensions to measure impact. It is important to keep in mind that every OLPC program is different and should be measured according to its specific goals.

We are working together with a community of people worldwide to define this new framework of dimensions and indicators to be able to measure their success. At the same time, we are developing strategies and mechanisms that help make the outcomes visible, understandable, and actionable by all audiences.

3.1 At the micro level. At the micro level, we propose the further development of digital portfolios to support reflection that can help students (as well as teachers and parents) be aware of their own learning, and do so by documenting their work and thinking over time (see Figure 3). The idea of increased utilization of portfolios is based on the work of Professor Evangeline Harris Stefanakis, from the School of Education at Boston University. Stefanakis shared her work on digital portfolios and multiple intelligences as part of a “comprehensive system that combines formal, informal, and classroom assessment, including portfolios, to inform the state, the district, the school, and the teacher.” As she points out (Stefanakis, 2002), without a way to make visible what students do and what teachers teach, it is impossible to make changes to improve those dynamics.

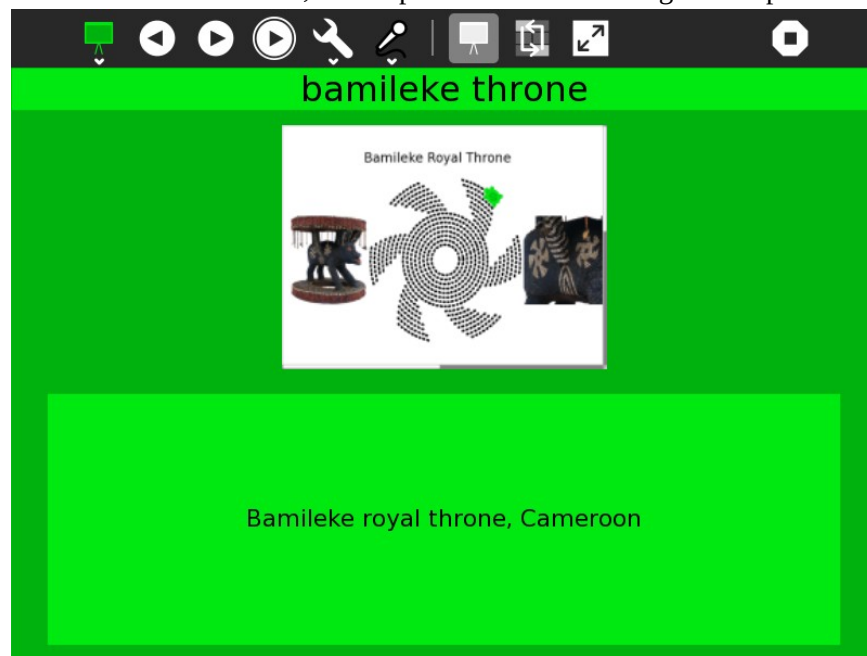


Figure 3: The Sugar portfolio activity draws upon Sugar journal entries to make a slide show of a learner’s work. It extracts the title, screenshot, and description as the elements from which it composes each slide. The user can add audio voice-over notes for each slide.

3.2 At the mezzo level. At a mezzo level, we propose to design tools that would help understand the impact and evolution of the program in a larger context, at the level of the classroom or the school. The goal is to design tools that navigate and visualize data backed up in a server, both in synchronous and



asynchronous way. These data would help teachers, administrators and stakeholders understand the impact of the program and make adjustments to it.

Typical of OLPC deployments is the use of a School Server. The School Server provides additional infrastructure extending the capabilities of the XO netbooks. While the Sugar-enabled XO netbooks are self-sufficient for many learning activities, other activities and services depend on the School Server providing connectivity, shared resources and services. Services, tools and activities running on the School Server allow asynchronous interaction, can use larger storage capacity, and take advantage of the processing power.

3.3 At the macro level. As an alternative from experimental evaluations, a strategy is proposed for understanding OLPC at a much larger scale. This strategy involves the design and implementation of a repository of objects or artifact designed by children from different OLPC programs, different countries, all over the world. There are a number of similar repositories with an important number of artifact from a individual kind exist already, e.g., the Scratch website.

The Scratch website is a portal for the community of 800K users from all over the world, who have created and shared two-million Scratch projects during more that four years. This important collection of Scratch projects makes possible the analysis and understanding of the impact of the Scratch program at a large scale, and the learning that emerges, not only at the individual, but also at the collective level. The number of users/projects and the emphasis on design, sharing, and collaboration (remixing) has made possible the understanding of the impact of the program at a large scale, and analysis of individual as well as collective learning that emerges in the community (see Figure X). It allows for understanding of the people who join the community (who we are), the projects they create and share (what we do), and the type of interactions and contributions they make (who makes what).

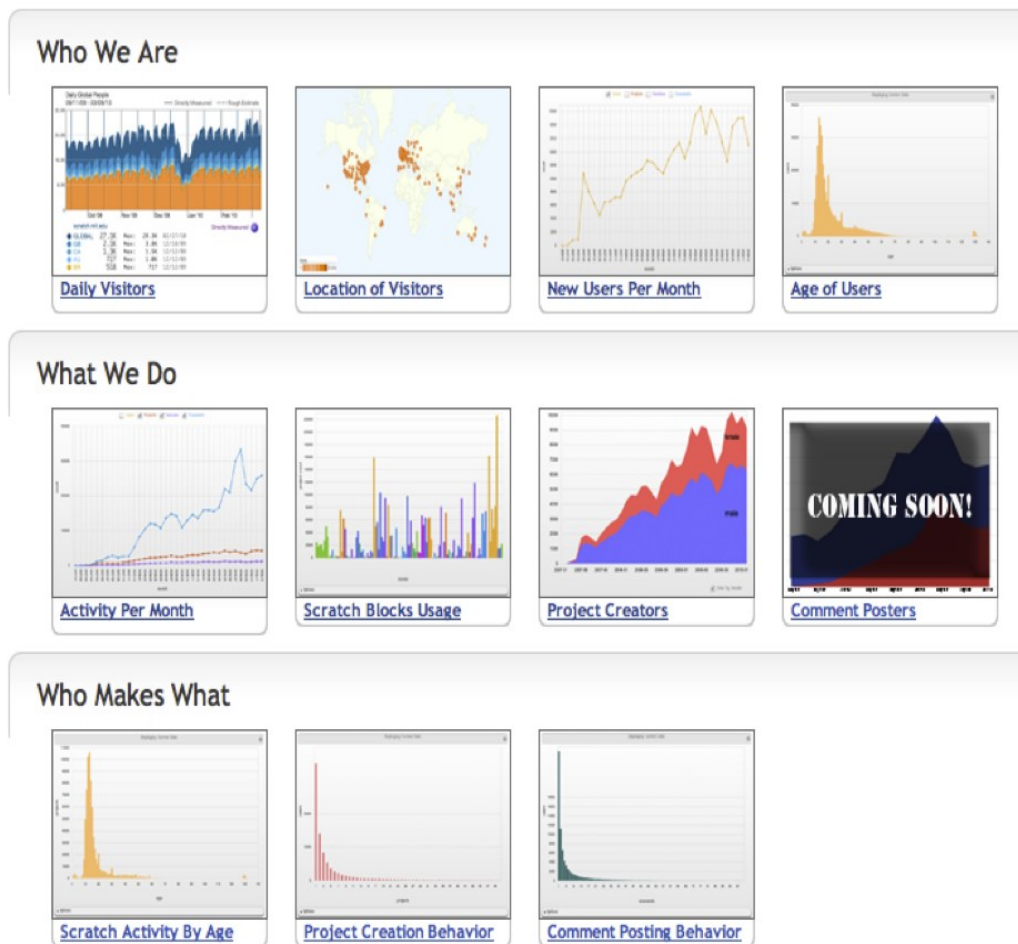


Figure 3: Statistic in the Scratch community

VIII. Learning Stories

While there is a plethora of expected quantitative and qualitative outcomes, no project should lose focus of smaller more subtle changes and outcomes witnessed in one student, groups of students, teachers, parents, etc. Here are some learning stories from Uruguay, Rwanda & Argentina that exemplify these important learning moments:

A New Confidence Gained (Uruguay)

The following story was posted to: <http://olpc-ceibal.blogspot.com/> by teacher Rosamel Ramírez and translated by Gabriel Eirea²

² The story has been edited from its original version for the purposes of this document

In my sixth grade class I had a 14-year-old student that didn't know how to read. He was very anxious to receive his laptop. He had serious behavioral and social problems inside the classroom. When the laptops arrived we distributed them and I suggested that each of the student compose text, of their choosing, in Write [one of the laptop's word processing applications]. The student really loved a play recently performed at the school; he had been moved by and identified with Nacho, one of the characters. He told me:

- Teacher, I want to write about Nacho... but I don't know how.
- Come and tell me what you want to write. He told me orally. He brought his laptop, opened Write and wrote everything he proposed himself. He knew almost all the different phonetics, but he didn't know how to join them.
- What a beautiful work you did! Now you have to read it to your classmates.
- But I don't know how to read.
- Ah, it doesn't matter, you will know because you did it (I said in a low voice with complicity and a wink). He read it many times in silence, he passed it to his notebook, he stood in the front and with tears in his eyes, and he read the text to the class.
- I know how to read, I know how to read! - He would shout, excited and smiling

For him it was an unforgettable day, he wrote and then read aloud and he continued reading, but seeing what all his other classmates had written... this is how he started his literacy.

Scratching Communities in Rwanda

You can find a related video here: <http://www.youtube.com/watch?v=1xScVy4MS0k>

When each child owns their own laptop it allows powerful initiatives both inside and outside school time. In May 2011, twelve students, ranging in ages from 10-12 years old, using the interactive programming activity on their XO's called Scratch, held Rwanda's first international Scratch Day event entitled "Rwandese Children Scratching their Communities." Over 136 parents, teachers, community members and other children attended the event to be taught more about Scratch by these young student-teachers. The goal of the day was to break down the traditional dynamics of the classroom in which a teacher is the center of focus and provide examples of learning outcomes in different environments. A key aspect to make this clear was that the students not only conduct the workshop but plan it. This process, relinquished some of the most powerful evidence of the advanced level and potential of the student-teachers. Originally, the proposed format of the workshop was to be an auditorium style presentation with participants following guided instruction. But while working with the students during preparation and planning sessions, they instead suggested that group work would be best and that dance and comedy should be incorporated into the workshop. On the day of the workshop, 60 teachers from neighboring schools, and some parents, filled the hall and followed along as the student-teachers shared stories, stopped the room every now and then for a quick dance while showing them the basics of programming. Student-teachers paced around the room eager and ready to answer the questions of their attentive students. In the afternoon the room filled with close to 70 children, some local students, other children living on the streets, who came inside after witnessing the commotion. These kids set next to other, helped each other and carefully followed along to the student-teachers.

At the end of the day the student-teachers were amazed of what they achieved. They never thought they would ever get to teach teachers! The amazing job they did was not only realized by them, but also their schools, because following the workshop, each of their schools asked them to continue teaching and holding their own classes forever changing their school's dynamic and showing what children can achieve with the right tools, environment and support.

Science Fair in La Rioja, Argentina

The following story was shared by Irma Silva, pedagogical advisor at Gabriela Mistral School

A group of 6th grade students are developing projects to show how the XO allows them to learn in different areas of the curriculum, ending assumptions that laptops are only used to play. The projects consist in creating a multimedia product using different activities of the XO laptop to reinforce or deepen learning of the Language, Social Studies, and Science curriculum for sixth grade.

Students interact with different activities of Sugar, and everyone chooses the activities they want to use for their projects according to their personal abilities and skills. Some students have chosen to use scratch, others memorize, write, record, and calculator. A group of girls have been writing a crossword puzzle, a word search, and a story which is then animated using scratch. For science class, students applied Tux Paint to assemble a game about the solar system and an animation of the planets using scratch. For social studies they use scratch to explain the Argentine provinces and parts of the province of La Rioja. In mathematics they are working with calculator, memorize, and scratch to study the content related to sexagesimal system and mathematical operations and calculations.

The projects will not only be presented at the school level but also at the state fair. Every week the students explain to their teachers what they have learned, and verbalize the challenges and achievements of the elaboration process, as well as reflecting on their own learning. They also work on their projects from home. At the same time, the students assemble a class portfolio in which they record their weekly progress.

Students expressed they believe that the XO is a valuable tool because.

- They learned to work together as a group, since they had to agree on how they would develop their projects.
- "The XO is not only to play, but also to learn"
- They realized that the other team members also have good ideas.
- They learned to be more responsible, to overcome differences, and to use time more effectively.

For me, this has been a beautiful and energetic experience. I enjoy watching their productions and learning process.

Appendix

A. Sugar Activities & Resources

<http://wiki.sugarlabs.org>

<http://activities.sugarlabs.org>

Open-end programming Activities

ETOYS

EToys is a media-rich authoring system aimed at helping children learn by doing. They can explore their ideas by creating models, simulations, and games complete with text, graphics, sound, and video.

<http://www.squeakland.org/about>

<http://www.squeakland.org/about/intro/>

<http://www.squeakland.org/tutorials/>

<http://wiki.laptop.org/go/Etoys> <http://wiki.laptop.org/images/2/28/OLPCEtoys.pdf>

PIPPY

Pippy is a simple and fun introduction to programming in Python, the dynamic programming language underlying much of the software on the laptop.

<http://wiki.laptop.org/go/Pippy>

SCRATCH

Scratch is an easy-to-learn multimedia programming language. It is great for storytelling.

<http://scratch.mit.edu/> (The Scratch community website)

<http://info.scratch.mit.edu/Support/Videos> (Introductory videos)

<http://info.scratch.mit.edu/@api/deki/files/568/=ScratchReferencev13.pdf>

http://info.scratch.mit.edu/Support/Scratch_Cards

<http://www.picocricket.com/picoboard.html> (The Picoboard, a device that connects Scratch to some interesting sensors)

TURTLEART

Turtle Art lets children program a Logo “turtle” to draw colorful and complex artwork.

<http://en.flossmanuals.net/turtleart>

http://wiki.laptop.org/go/Turtle_Art

http://wiki.laptop.org/go/Turtle_Art_with_Sensors

http://wiki.laptop.org/go/Turtle_Art_student_guide

<http://www.ceibal.edu.uy/portal/recursos/educativos/tortugarte.htm> (Spanish TurtleArt guide from Plan Ceibal)

Construction Activities



CALCULATE

Calculate provides a generic calculator with a simple, straightforward interface. Designed to be intuitive for even the youngest children, it also supports advanced mathematics and Boolean logic.
<http://wiki.laptop.org/go/Calculate>

MEMORIZE

Memorize is the classic matching-pairs memory game with a twist: each card can consist of any multimedia object, such as images, sounds and text.
<http://wiki.laptop.org/go/Memorize>

PAINT

The Paint activity provides a canvas for a child's creative expression. Children can draw free-form images with a paintbrush and pencil, and use the dedicated toolbar to play and experiment with shapes. Text support, image import functionality, and an interactive placement system give children limitless ways to explore their creativity. http://wiki.laptop.org/go/Paint_%28Oficina%29

RECORD

The Record activity provides a simple way for children to take pictures, view slideshows, and record video and audio.
<http://en.flossmanuals.net/record>

TamTamJAM

All TamTam activities provide a fun, powerful way to collaborate musically.
<http://wiki.laptop.org/go/TamTamJam>

WRITE

Write is a basic text editing application featuring. It provides an easy way for children to write a story, craft a poem, or complete an essay, as well as more advanced features like image insertion, table creation, and layout operations.
http://en.flossmanuals.net/write_activity

Utilities Activities

BROWSE

Browse is a simple Web application that allows children to access the Internet and share links among their friends.
<http://en.flossmanuals.net/browse>

CALCULATE

Calculate provides a generic calculator with a simple, straightforward interface. Designed to be intuitive for even the youngest children, it also supports advanced mathematics and Boolean logic.
<http://wiki.laptop.org/go/Calculate>



CHAT

The Chat activity provides a simple environment for discussion, whether it's between two individuals or an entire classroom.

<http://en.flossmanuals.net/chat>

DISTANCE

Distance is a two-laptop collaborative activity that can be used to measure the distance between them.

<http://wiki.laptop.org/go/Distance>

MEASURE

Measure allows children to measure, log data and create graphs of sounds, electrical current and other signals.

<http://wiki.laptop.org/go/Measure>

READ

Read is a basic PDF or document viewer. Providing basic controls for page navigation and a variety of zoom tools, it makes it easy to read a book in either laptop or handheld modes.

<http://wiki.laptop.org/go/Read>

WIKIPEDIA

It is an offline Wikipedia snapshot containing hundreds of useful articles and images for reference, even without access to the internet. http://wiki.laptop.org/go/WikiBrowse_English

Games:

IMPLODE

Implode is a colorful game of logic.

<http://wiki.laptop.org/go/Implode>

MAZE

The Maze activity presents children with an increasingly more difficult series of mazes to navigate via the keyboard, competing for best times with their friends.

<http://wiki.laptop.org/go/Maze>

MOON

Moon provides a neat graphical interface illustrating the current phase of the moon, with a variety of display options.

<http://wiki.laptop.org/go/Moon>

SPEAK

Speak offers a fun and goofy face which will speak any text you type.



<http://wiki.laptop.org/go/Speak>

System Activities

ANALYZE

The Analyze activity provides detailed diagnostic information for more experienced users and developers.

<http://wiki.laptop.org/go/Analyze>

LOG

The Log activity is a tool mostly for developers, which exposes the logs kept by Sugar and activities in a simple UI.

<http://wiki.laptop.org/go/Special:Browse/Log>

TERMINAL

Terminal offers a graphical wrapper for the common command-line interface familiar in Unix, allowing kids to dig deeper into their systems, issue commands, and make modifications to their laptops.

http://wiki.laptop.org/go/Terminal_Activity <http://en.flossmanuals.net/terminal>

Appendix

B. Suggested Reading

1. *Designing Multimedia Environments for Children* by Allison Druin & Cynthia Solomon
2. *Computer Environments for Children: A Reflection on Theories of Learning and Education* by Cynthia Solomon
3. *Mindstorms* by Seymour Papert
4. *The Connected Family* by Seymour Papert
5. *The Children's Machine* by Seymour Papert
6. *TurtleArt* by Artemis Papert & Brian Silverman
7. *One to One Connections: Building a Community Learning Culture* by Claudia Urrea (see Appendix IV)
8. Future of Learning Group at MIT Media Lab: <http://learning.media.mit.edu/>